March 27, 1998 Vol. 37, No. 6

Spaceport News

America's gateway to the universe. Leading the world in preparing and launching missions to Earth and beyond.

John F. Kennedy Space Center

Shuttle Update

STS-90

STS-90, Columbia
90th Shuttle, 25th OV-102
April 16, 2:19 p.m. EDT
Pad 39B, KSC
Neurolab
Flight Readiness Review: April 2

STS-91

STS-91, Discovery
91st Shuttle, 24th OV-103
May 28, 8:05 p.m. EDT
Pad 39A, KSC
9th Shuttle-Mir docking

STS-88

STS-88, Endeavour
92nd Shuttle, 13th OV-105
July 9,12:44 p.m. EDT (under review)
Pad 39B, KSC
1st International Space Station (ISS) assembly flight

STS-95

STS-95, Discovery
93rd Shuttle, 25th OV-103
Oct. 29, 2 p.m. EDT
Pad 39B, KSC
SPACEHAB; SPARTAN

STS-93

STS-93, Columbia
94th Shuttle, 26th OV-102
Dec. 3, 2:50 p.m. EST (no earlier than)
Pad 39A, KSC
Advanced X-Ray Astrophysics Facility

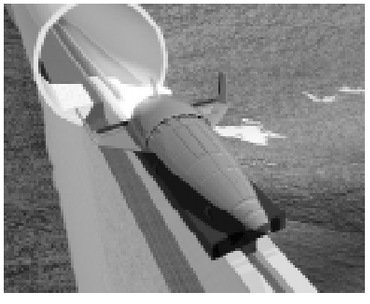
STS-96

STS-96, Endeavour
95th Shuttle, 14th OV-105
Dec. 9, 10:09 p.m (under review)
Pad 39A, KSC
2nd ISS assembly flight

KSC takes lead in formation of ISO space systems standards

KSC's experience as a site where vehicles and payloads are prepared for flight and launched is being put to good use in the development of universal standards for how such work is done.

Larry Schultz, a veteran aerospace engineer in the Engineering Development Directorate for NASA at KSC, is working on a series of standards for the International Organization for Standardization (ISO).



FUTURE flight vehicles, such as the successor to the X-33 or X-34, could rely on ground support equipment designed to new ISO standards being developed by a KSC-led team.

Collaborating with an international team, Schultz recently submitted for review by ISO membership a new ISO standard, *Space Systems — Ground support equipment for use at launch, landing or retrieval sites — general requirements.* If approved, the standard would become part of a pool of more than 11,000 ISO standards which also includes one familiar to most KSC employees: ISO 9000, the standard for quality management.

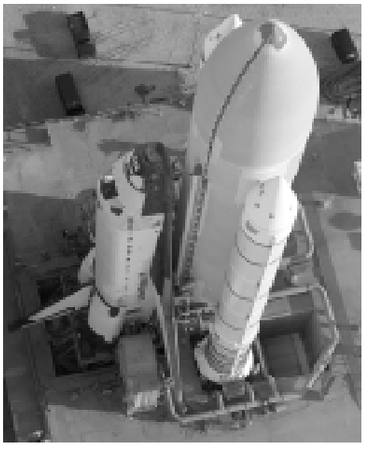
There are eight or more launch sites around the world where ground support equipment may be used, Schultz explained. For each type of launch vehicle flown, and for each new payload launched, a set of requirements must be defined for the design and development of the GSE needed to support that flight

(See STANDARD, Page 4)

All-American Picnic is May 16

Don't forget — The KSC All-American Picnic is set for May 16, 10 a.m. to 4 p.m., at KARS Park I. The Web site address is: **http://www.ksc.nasa.gov/events/1998/picnic**

One step closer



SHUTTLE Columbia rolls out to Launch Pad 39B on March 23, completing the final Earth-bound leg of the journey into space.

Space center provided $1.038 billion boost to Florida's economy in Fiscal Year 1997

Space-related employment and contracts at NASA Kennedy Space Center yielded a $1.038 billion boost to Florida's economy during the 1997 fiscal year which ended Sept. 30.

This figure represents $915 million in contract dollars and purchases along with $122.6 million in civil service personnel compensations.

About 92 percent of the Florida impact dollars, approximately $781.5 million, was expended within Brevard County. Of the total expenditures, $719.2 million went to contractors operating on-site at the space center.

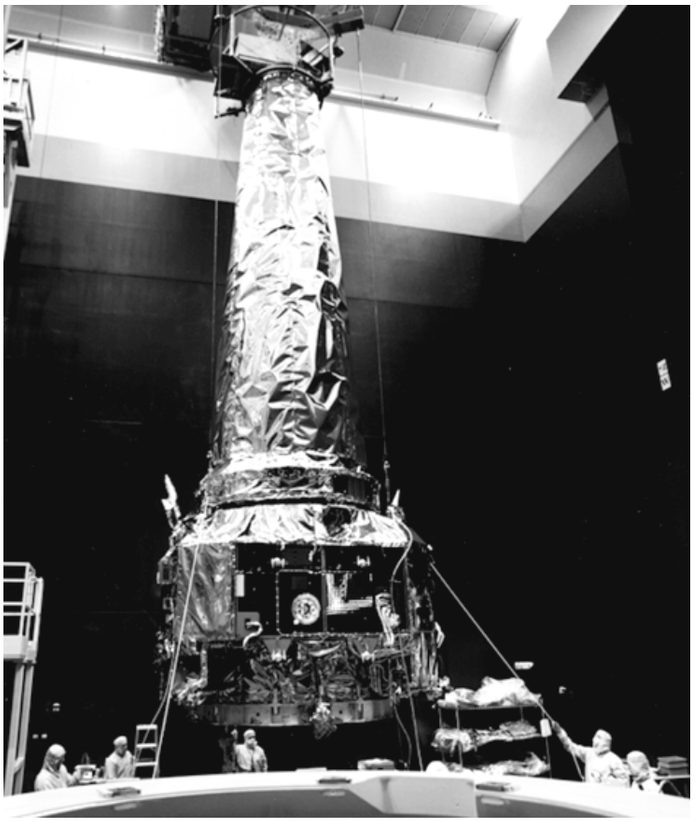
An additional $62.3 million went to off-site businesses in Brevard County, while $40.6 million was awarded to Florida businesses outside the county. Out-of-state purchases totaled about $166.8 million.

KSC surpassed its small business contract goal of $50 million by awarding over $72 million in contracts to small, disadvantaged and woman-owned businesses.

Permanent federal employees at KSC totaled 1,940 on Dec. 31, 1997. While about 2,948 people were employed through construction and tenant jobs at KSC, the majority of the workers were employed by the on-site contractors and numbered about 9,798. Approximately

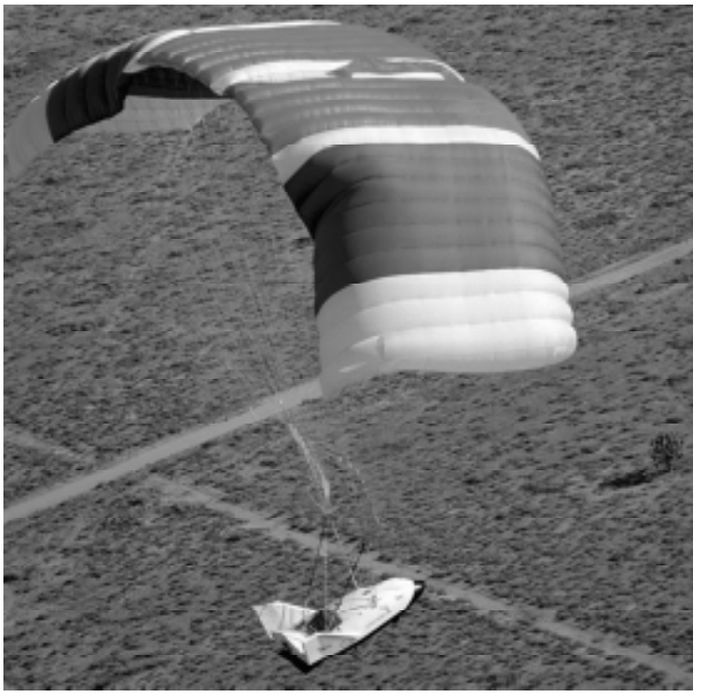
(See IMPACT, Page 2)

AXAF assembly complete



ASSEMBLY of the Advanced X-ray Astrophysics Facility was completed in early March at the TRW assembly plant in California. A checkout of the fully assembled spacecraft is now under way.

First X-38 free flight



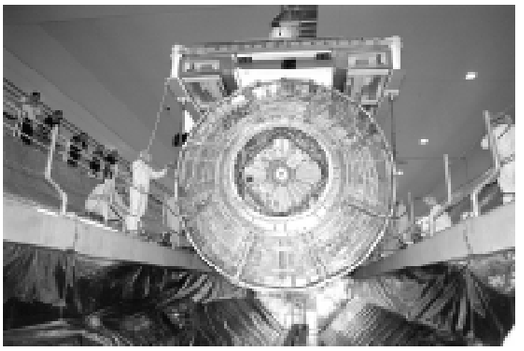
FIRST free-flight of the X-38 subscale demonstrator was completed March 12 at Dryden Flight Research Center. Additional tests are planned.

Node 1 displays an air-tight seal

A four day leak-check test of the Node 1 space station element concluded last week, with the flight hardware displaying virtually no signs of leakage.

Node 1 and the attached Pressurized Mating Adapter-1 were installed in the Payload Canister Transporter for the test. The Node 1 was then pressurized with a partial mixture of helium and air. Helium sensors installed in the canister monitored the hardware for signs of helium leakage. Payload managers were delighted with the results, which confirmed the integrity of the U.S.-built hardware.

"The leak test was very successful," said STS-88 Payload Manager Steve Ernest, adding that one more pressurization test will be conducted following final Node 1 closeouts and prior to rollout to the pad.



NODE 1 and a Pressurized Mating Adapter are lowered into the Payload Canister on March 9 to begin a helium leak check. Ensuring that the hardware is sealed against exposure to the vacuum of space is a key aspect of preparing International Space Station hardware for flight.

Dates change for two West Coast expendable vehicle launches

Launch of the Transition Region and Coronal Explorer (TRACE) has slipped from March 19 to April 1, and the planned July launch of Landsat-7 also has been delayed.

TRACE is the fourth in NASA's series of Small Explorer satellites. It will study the sun from a vantage point over the Earth's poles, collecting data that could yield a better understanding of solar flares — a phenomenon that sends enormous amounts of high-energy radiation streaming toward Earth with the potential for disrupting satellite communications and terrestrial electric power lines.

Landsat-7 is the latest installment in a long history of land remote-sensing spacecraft. Launch is being delayed because of required changes in the design of the electrical power supply hardware for the spacecraft's sole science instrument.

Impact ...

(Continued from Page 1)

14,686 workers were employed at KSC through the close of the year.

These numbers do not take into account the 1998 Civil Service buyouts or the reorganization of the prime Shuttle contractor, United Space Alliance.

Jan. 31 was the last day NASA employees could take advantage of the agency's fourth buyout offer.

The downsizing resulted in the voluntary departure of 75 federal employees, leaving KSC with a current civil service work force of about 1,925.

A second buyout of 1998, the fifth since 1994, is scheduled to be completed on April 3.

Special delivery

STS-87 crew member Steve Lindsey signs a mailbox built by United Space Alliance (USA) employee Hugh Jordan. A storekeeper in the Logistics Facility, Jordan does woodworking for a hobby. This orbiter mailbox is the first of several unique mailboxes he's made. Other recent Space Flight Awareness activities included the award of a Silver Snoopy to Mark Carter, also of USA.

Fishing clinic for kids set for April 4

The Space Coast Sports Fishing Foundation, Florida's Department of Environmental Protection and the Merritt Island National Wildlife Refuge are sponsoring a one-day fishing event for youngsters on Saturday, April 4, from 9 a.m. until 1 p.m.

KARS II will be the staging and parking area for the event. Children of all ages are invited, but they must be accompanied by an adult. Buses will be available beginning at 8:30 a.m. to shuttle participants to the fishing area along a 2,000-foot length of the NASA Causeway. A series of educational stations will be set up, covering such topics as where fish live, fishing tackle, and casting.

Participants should plan to wear comfortable clothing, and bring sunscreen, insect repellant, drinks and a snack. Fishing gear will be provided to those who don't have their own.

The event is open to all Brevard County residents and does not require a badge. Registration will be held at KARS II the morning of the event. Volunteers are needed to work the education stations and assist with fishing instruction. If you would like to help, contact the refuge at 861-0667.

Boeing employees extend support to tornado victims

Local Boeing employees gave generously to help victims of the deadly tornadoes that recently ravaged Central Florida. Boeing contributed more than $43,000 to the Central Florida Red Cross. The money will go directly to victims in the form of vouchers that the families can use to purchase food, clothing and other items, according to the Central Florida American Red Cross.

BRUCE Melnick, senior site executive, Boeing Florida Operations (second from right) and Deanna Bongiorno (second from left), Employees Community Fund of Boeing Florida board member, present a check for $43,171 to Lynn Hinson (left), American Red Cross of Central Florida chairman and Sumner Hutcheson III, Red Cross chief executive officer.

New Web site focuses on benchmarking

Few organizations that benchmark have a formal process to transfer knowledge of "best practice" data. Best practice refers to a process or way of doing business that is most effective and yields superior results.

A new Web site at KSC will help make best practice information readily available. It is run by the Kennedy Benchmarking Clearinghouse, chartered by the KSC Integrated Working Group in 1994.

The group provides assistance, training and guidance to benchmarking study teams. A benchmarking methodology, contact list and the best practice results from past studies are available on the Web page.

Time and resources have been cited as the biggest challenges facing benchmarkers. This electronic information source is one strategy to improve a benchmarking study team's efficiency and the KSC bottom line.

The URL is **http://www-hm.ksc.nasa.gov/hmcic/kbc-bro1.htm**

Job Fair scheduled April 1-2 at KSC

The KSC NASA Personnel Office is sponsoring a NASA Job Fair in the Industrial Area on April 1-2. The purpose of the job fair is to allow other NASA Centers to consider KSC NASA employees for reassignment opportunities.

Civil Service opportunities will be best for current Aerospace Technologists (all options). However, at least three Centers (Goddard, Langley, and Stennis) have indicated an interest in considering employees working as Flight Controllers, Personnel Specialists, Contract Specialists, Program Analysts, Accountants, Security Specialists, Quality Assurance Specialists, and Business Management Specialists.

Representatives from all other NASA centers except Langley will be on hand at the Job Fair April 1 from 9 – 11:30 a.m. in Building TRM-003, at the corner of 2nd St. and B Ave., and from 1 – 3:30 p.m. the same day. Interviews will be scheduled by appointment only for the following day.

The Langley Research Center will have officials on-center April 2. They will conduct a briefing at 9 a.m. in Headquarters, Room 1625, followed by interviews throughout the day.

Both Langley and Ames have additional information about their facilities posted on Web sites:

Langley: http://ohr.larc.nasa.gov/pmb/jobfair.html

Ames: http://huminfo.arc.nasa.gov/CodeM/index.html

For more information, contact Jim Quinn, Personnel Office, tel. 867-2508.

Songbird Festival planned in April

The Merritt Island National Wildlife Refuge is hosting a Welcome Back Songbirds Festival on Saturday, April 4, beginning at 8 a.m. An early bird tour, a seminar on beginning birding and habitat games for children and birding videos are among the many events planned. A field trip on Black Rails, limi ted to the first 20 people who sign up and starting at 5 p.m., also is being offered.

Undeveloped areas such as the refuge are critical to the survival of migratory songbirds. Festival attendees are encouraged to bring a picnic lunch as well as binoculars, a bird field guide and bug repellent. For more information contact the refuge, tel. 861-0667.

Standards ...

(Continued from Page 1)

hardware and the use site.

Ground support equipment (GSE) encompasses nonflight systems, equipment, or devices necessary to support the operations of transporting, receiving, handling, assembly, inspection, test, checkout, servicing, launch, and recovery of a space system at launch, landing, and retrieval sites.

An aerospace engineer who has worked at KSC since January 1967, Schultz observed over the years the inconsistency and multitude of ground support documents. He recalls that when the center was preparing for the first Shuttle flight, non-KSC built ground support equipment would arrive in Florida, only to require retesting or reworking because it was not designed to KSC requirements.

Of particular concern is compatibility with launch site safety and reliability requirements, Schultz said.

"It seems like every program had its own ground support requirements document," Schultz noted. "The Shuttle program has a document, the International Space Station program has a document: We were reinventing the wheel.

"I felt that we needed to come up with something that would be faster, better and cheaper," he continued. "There ought to be some sort of worldwide basis around which GSE could become more standardized."

Over a three-year period, Schultz and an international team that included representatives from France, Germany, Russia and Japan communicated with each via fax, e-mail, telephone and several face-to-face meetings.

The result of their collaboration is a compact 33-page document that covers five separate functional categories of equipment servicing, checkout and test, handling and transportation, auxillary, and umbilical ground support equipment.

The new GSE standard, ISO 14625, establishes a uniform set of requirements that meets the need to provide simple, robust, safe, reliable, maintainable, and cost-effective ground support equipment that is compatible with the launch, landing, or retrieval site, Schultz explained.

Utilization of this standard will speed equipment development, lower development and operating costs, increase reliability, minimize risk, enhance safety, and ensure mission success.

This standard will also increase competition by encouraging new companies to enter the field of ground support equipment design and should encourage new space system enterprises by simplifying ground support equipment development, Schultz believes.

The International Standard would be used in the design of nonflight hardware systems and the applicable software that supports the flight hardware ground processing operations of space vehicles and payloads at the launch, landing, or retrieval site. The requirements of the standard may also be applied to equipment used only at flight hardware manufacturing, development, or test sites or at the mission control site. The International Standard specifies the general characteristics, performance, design and construction, test, safety, reliability, maintainability, and quality requirements for ground support equipment.

ISO MAN — Aerospace engineer Larry Schultz is a space program veteran. He is responsible for maintaining ground support equipment (GSE) documentation for the Engineering Development Directorate at KSC, and he also wrote the agency standard for GSE. Schultz also makes sure that KSC's comments on proposed ISO standards is forwarded, and he ensures that other NASA centers and industry get a chance to look at the standards being formulated by his subcommittee. He is shown here at a testing ground for GSE at the space center, the Launch Equipment Test Facility.

The standard is now being translated into French for review by ISO membership. If approved, it will be published later this year. Schultz is quick to note that the standard is not retroactive; it applies only to new equipment still to be designed and built. While the X-33 and X-34 advanced technology demonstrator efforts are probably too far along to be affected, a potential application may be the future advanced transportation vehicle that will be the successor of the X-33 and X-34.

Just as every mission into space begins on the ground, so the standardization of space has begun on the ground with ISO Standard 14625, Schultz says. He and his international colleagues are already working on 27 other new standards on such topics as flight-to-ground umbilicals, fluid sampling and test methods and fluid characteristics.

"ISO 14625 is the first of many ISO standards that will revolutionize the international space industry and make space accessible to every one on this planet Earth," Schultz said.

ISO's goal: A borderless world

• ISO was formed in 1947 to promote standardization and related activities in order to encourage the international exchange of goods and services. Although economics might seem to be the driver behind such standardization, the organization feels that eliminating trade barriers can also lead to a better standard of living.

• Currently, there are more than 11,000 ISO standards.

• ISO has 124 member countries, supported by 3,000 technical bodies with 30,000 volunteer experts. It is headquartered in Geneva.

NASA marks 40 years in 1998

NASA will celebrate its 40th year this October. To honor the milestone, the agency unveiled a logo which will appear on NASA publications and other materials in the coming months.

Fortieth Anniversary
Pioneering the Future

John F. Kennedy Space Center

Spaceport News

The *Spaceport News* is an official publication of the Kennedy Space Center and is published on alternate Fridays by the Public Affairs Office in the interest of KSC civil service and contractor employees.

Contributions are welcome and should be submitted two weeks before publication to the Media Services Branch, AB-A. E-mail submissions can be sent to Paula.Shawa-1@ksc.nasa.gov

Managing editor. . . . . Bruce Buckingham
Editor. . . . . Paula Shawa
Editorial support provided by Sherikon Space Systems Inc. Writers Group.
Photographic support primarily provided by The Bionetics Corp. and Public Affairs Photographer George Shelton, also of Bionetics.

USGPO: 633-112/80002